

REMARKS

Claims 1, 3-4, 6, and 8-13 are pending in this application. All of the claims were rejected in the June 5, 2007 Final Office Action (the “Action”). Reconsideration and withdrawal of the rejection and allowance of all claims are respectfully requested in view of the following remarks.

The contents of the Declaration Under 37 C.F.R. §1.132, filed April 27, 2007, are incorporated herein by reference.

As a preliminary matter, Applicants note that claim 1 is amended herein to incorporate the recitations of claim 7. Claim 1 is also amended to more clearly recite how a precursor of the perovskite-type composite oxide is prepared from elementary components of the perovskite-type composite oxide. For the sake of clarity, Claim 1 is amended herein to explicitly recite that the organometal salts include salts of a noble metal component of the perovskite-type composite oxide. No new issues are believed to be raised by these amendments. Claims 2, 5 and 7 are canceled herein.

Interview Summary

The Examiner is thanked for the courtesies extended to Applicants’ representative in a telephone interview on June 28, 2007. Claim 1 and the Declaration Under 37 C.F.R. §1.132, filed April 27, 2007, were discussed during the interview, particularly with respect to the JP-663 reference. The Examiner took the position that the Declaration compares the use of palladium acetylacetonate to nitrate.

Declaration Under 37 CFR §1.132

A Declaration Under 37 CFR §1.132 including the remarks made therein by another of the named inventors, Kimiyoshi KANEKO, is incorporated herein by reference.

Claim Rejection Under 35 U.S.C. §102

Claims 1-13 are rejected under 35 U.S.C. §102(b) as allegedly being anticipated by Japan Patent Document No. 11-262,663 (“JP-663”). Applicants respectfully traverse this rejection.

As a preliminary matter, as discussed during the interview, Applicants’ representative mistakenly indicated in the prior amendment that JP-663 does not teach or suggest mixing organometal salts. This error was an inadvertent error and was not intend to mislead the Examiner or the Patent Office. $\text{Pt}(\text{C}_5\text{H}_7\text{O}_2)_2$ (palladium acetyl acetonato) described in JP-663 is believed to be an organometal salt.

The Examiner is thanked for his consideration of the Declaration Under 37 C.F.R. §1.132 submitted with the prior amendment on April 27, 2007. Applicants intended to explain the Declaration in more detail in the prior Amendment, and will do so herein.

Applicants respectfully traverse the anticipation rejection at least because JP-663 does not teach the presently claimed method that includes forming a precursor of the perovskite-type composite oxide by mixing an organometal salt of a noble metal with other elementary components of the perovskite-type composite oxide, and then heat treating the precursor.

In JP-663 (See Example 1), an alkoxide of strontium ($\text{Sr}(\text{OC}_3\text{H}_7)_2$) and an organometal salt of platinum is mixed, then the resulting mixture is added to a support dispersion liquid and baked to form a Pt composite oxide layer. As shown in Example 1 of JP-663, a Pt composite

oxide layer is formed by supporting a mixture with MgAl₂O₄. The perovskite-type composite oxide resulting from the methods of JP-663 does not have the structure and advantages of the present invention.

In the present invention, a perovskite-type composite oxide having a specific structure can be produced by mixing an organometal salt of a noble metal with the other elementary component, and subjecting the resulting mixture to heat treatment. The perovskite-type composite oxide thus obtained from the present methods has the significant effect that a noble metal can be effectively dispersed in the perovskite-type composite oxide to improve the rate of solid solution. This improved result is demonstrated for example, in the Declaration Under 37 C.F.R. §1.132 submitted on April 27, 2007.

As can be seen from the Declaration, submitted April 27, 2007, although Example 1 using organometal salts of noble metal has the same written composition as Comparative Example 1 using nitrates, Example 1 has a higher rate of solid solution, and demonstrates self-regenerative function (solid solution and deposition), as compared to Comparative Example 1. As shown at Table 4 of the Declaration, a perovskite-type composite oxide made using the presently claimed methods (Example 1) has a much higher rate of solid solution (93%), than a perovskite type composite oxide (Comparative Example 1) having a similar written composition, but made using a method that does not include preparing a precursor by mixing the elementary components (57%).

The results also show that purifying performance after endurance test is also improved. For example, as shown in Table 3, the 20% and 50% purification temperatures for Example 1

were much lower than for Comparative Example 1. Additionally, the 400° C purification rate was much higher for Example 1 than for Comparative Example 1.

Further, in JP-663, a Pt composite oxide layer is merely formed by mixing an alkoxide of strontium ($\text{Sr}(\text{OC}_3\text{H}_7)_2$) an organometal salt of platinum ($\text{Pt}(\text{C}_5\text{H}_7\text{O}_2)_2$), and supporting the resulting mixture with MgAl_2O_4 . However, in JP-663, a perovskite-type composite oxide having a specific structure as described in the present invention is not produced.

In the present invention, a perovskite-type composite oxide having a specific structure can be produced by mixing an organometal salt of a noble metal with the other elementary component, and subjecting the resulting mixture to heat treatment. The perovskite-type composite oxide thus obtained from the present methods has the significant effect that a noble metal can be effectively dispersed in the perovskite-type composite oxide to improve the rate of solid solution. This improved result is demonstrated for example, in the Declaration Under 37 C.F.R. §1.132 submitted on April 27, 2007.

Further, in the present invention, a perovskite-type composite oxide having a specific structure can be produced by mixing an organometal salt of noble metal with the other elementary component, and the resulting mixture is subjected to heat-treatment. The perovskite-type composite oxide thus obtained has a significant effect that a noble metal can be effectively dispersed in the perovskite-type composite oxide to improve rate of solid solution. Further, in the perovskite-type composite oxide, the noble metal can be finely and highly dispersed therein and can maintain their high catalytic activities even in long-term use because of a self-

regenerative function, in which the noble metal undergoes repetitive solid solution under an oxidative atmosphere and deposition under a reduced atmosphere.

As can be seen from the Declaration Under §1.132, submitted on October 26, 2007, the same composite oxide as JP-663 and the support supporting the same composite oxide as JP-663 with MgAl₂O₄ do not produce a crystal structure though baked at 500°C as shown in JP-663. The crystal structure is produced by baking at 1000°C, which is disintegrated after oxidation treatment and reduction treatment.

Further, in the perovskite-type composite oxide of the present invention, the noble metals can be finely and highly dispersed therein and can maintain their high catalytic activities even in long-term use because of a self-regenerative function, in which the noble metal undergoes repetitive solid solution under an oxidative atmosphere and deposition under a reduced atmosphere.

Accordingly, the composite oxide shown in JP-663 cannot produce a significant effect as the perovskite-type composite oxide having a specific structure of the present invention.

For at least these reasons, Applicants respectfully submit that the presently claimed methods are not anticipated by the JP-663 reference, and reconsideration and withdrawal of the rejection are earnestly solicited. Because the only rejection is believed to be overcome herein, Applicants respectfully request allowance of the present claims.

If the Examiner believes that there is any issue that could be resolved by a telephone or personal interview, the Examiner is respectfully requested to contact one of the undersigned attorneys at the telephone number listed below.

Amendment Under 37 C.F.R. § 1.116
U.S. Application No.: 10/520,068

Attorney Docket No.: 71465.0010
Customer Number 57362

Applicants hereby petition for any extension of time which may be required to maintain the pendency of this case, and any required fee for such an extension is to be charged to Deposit Account No. 50-0951.

Respectfully submitted,

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